

### **AMENDMENTS TO THE CLAIMS**

1. (Currently Amended) A method for automatic dose control of one or more chemicals in a liquid treatment system, which comprises:

inputting properties of a liquid into a predefined adaptation model to output an adaptation coefficient;

modifying ~~a change of control in the~~ control surface of a linguistic equation (LE) controller adaptively; using the ~~predefined adaptation coefficient model and the properties of the~~ liquid; and

controlling the dosing of one or more chemicals to the liquid by said one or more LE controllers to output a dosage for said one or more chemicals.

2. (Previously Presented) The method of claim 1, wherein a linguistic equation associated with said linguistic equation (LE) controller is a dynamic linguistic equation.

3. (Previously Presented) The method of claim 1, wherein a linguistic equation associated with said linguistic equation (LE) controller is a static linguistic equation.

4. (Previously Presented) The method of claim 1, wherein a linguistic equation associated with said linguistic equation (LE) controller is a non-linear linguistic equation.

5. (Currently Amended) The method of claim 1, wherein ~~said at least one of said LE~~ controllers ~~includes~~ is a feedback controller for determining a change of control of said LE controller based on a difference between an output of said system and a setpoint.
6. (Currently Amended) The method of claim 1, wherein ~~said at least one of said LE~~ controllers ~~includes~~ is a feedforward controller for determining the dosing of one or more chemicals to the liquid by compensating for process disturbances in advance.
7. (Currently Amended) The method of claim 1, further comprising using one of more cascade controllers connected to said LE controller, to improve control- by changing one or more treatment process requirements or fitting a set point to one or more process requirements of one or more liquid treatment sub-processes.
8. (Currently Amended) The method of claim 1, wherein one of said properties of the liquid ~~are described by~~ is a quality index of the liquid.
9. (Previously Presented) The method of claim 8, wherein said quality index is purity index.
10. (Previously Presented) The method of claim 1, wherein said liquid is water.
11. (Previously Presented) The method of claim 1, wherein said liquid treatment system is a water purification system.

12. (Currently Amended) The method of claim 1, wherein said chemicals are coagulants, flocculants, oxidants, reductants, adsorbents, dispersing agents, biocides, ~~or~~ defoamers, or combinations thereof.

13. (Currently Amended) The method of claim 1, wherein said properties of the liquid are defined from incoming liquid which enters said liquid treatment system.

14. (Currently Amended) The method of claim 1, wherein said properties of the liquid are defined from outgoing, treated liquid which exits said liquid treatment system.

15. (Currently Amended) The method of claim 1, wherein said predefined adaptation model is performed by a LE-model.

16. (Currently Amended) The method of claim 1, wherein said predefined adaptation model is performed by a fuzzy model.

17. (Currently Amended) The method of claim 1, wherein ~~said~~ an adaptation performed by said predefined adaptation model is based on performed by remote operation, whereby one or more parameters of said adaptation model is/are evaluated and/or updated by a remote processor in connection with a remote data system.

18. (Currently Amended) A device arrangement for automatic dose control of chemicals in a liquid treatment system, said device arrangement comprising:

one or more predefined adaptation ~~models~~ subsystems which inputs properties of a liquid and outputs at least one adaptation coefficient; and

a linguistic equation (LE) controller operatively connected to said one or more predefined adaptation subsystems,

wherein ~~a change of control in the control surface of the linguistic equation (LE) controller is modified adaptively using the at least one of said predefined adaptation coefficient models and the properties of the liquid,~~ to control the dosing of one or more chemicals to the liquid by said LE one or more controllers and output a dosage for said one or more chemicals for said liquid treatment system.

19. (Previously Presented) The device arrangement of claim 18, wherein a linguistic equation associated with said linguistic equation (LE) controller is a dynamic linguistic equation.

20. (Previously Presented) The device arrangement of claim 18, wherein a linguistic equation associated with said linguistic equation (LE) controller is a static linguistic equation.

21. (Previously Presented) The device arrangement of claim 18, wherein a linguistic equation associated with said linguistic equation (LE) controller is a non-linear linguistic equation.

22. (Currently Amended) The device arrangement of claim 18, wherein said LE controller

~~includes at least one of said controllers~~ is a feedback controller.

23. (Currently Amended) The device arrangement of claim 18, wherein said LE controller at least one of said controllers is includes a feedforward controller.

24. (Currently Amended) The device arrangement of claim 18, wherein ~~a controller setup in~~ said device arrangement comprises one of more cascade controllers connected to said LE controller, for improving control by changing one or more treatment process requirements or fitting a set point to one or more process requirements of one or more liquid treatment sub-processes.

25. (Previously Presented) The device arrangement of claim 18, wherein said properties of the liquid are described by quality index.

26. (Previously Presented) The device arrangement of claim 25, wherein said quality index is purity index.

27. (Previously Presented) The device arrangement of claim 18, wherein said liquid is water.

28. (Previously Presented) The device arrangement of claim 18, wherein said liquid treatment system is a water purification system.

29. (Currently Amended) The device arrangement of claim 18, wherein said chemicals are coagulants, flocculants, oxidants, reductants, adsorbents, dispersing agents, biocides, ~~or~~ defoamers, or combinations thereof.

30. (Currently Amended) The device arrangement of claim 18, wherein said properties of the liquid are defined from incoming liquid which enters said liquid treatment system.

31. (Currently Amended) The device arrangement of claim 18, wherein said properties of the liquid are defined from outgoing, treated liquid which exits said liquid treatment system.

32. (Currently Amended) The device arrangement of claim 18, wherein one of said one or more predefined adaptation subsystems is ~~arranged to be performed by a~~ LE-model subsystem.

33. (Currently Amended) The device arrangement of claim 18, wherein one of said one or more predefined adaptation subsystems is ~~arranged to be performed by a~~ fuzzy model subsystem.

34. (Currently Amended) The device arrangement of claim 18, wherein an said adaptation process of said one or more predefined adaptation subsystems is ~~performed by based on~~ remote operation whereby one or more parameters of said one or more adaptation subsystems is/are evaluated and/or updated by a remote processor in connection with a remote data system.

35. (Previously Presented) The device arrangement of claim 18, said device arrangement

further comprising an intelligent analyzer which is an implemented software module or device representing measurement handling routines.